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COIMBATORE-641 035, TAMIL NADU



DEPARTMENT OF AEROSPACE ENGINEERING

19ASB303 AIRCRAFT MAINTENANCE ENGINEERING

UNIT-1 AIRCRAFT GROUND HANDLING AND SUPPORT EQUIPMENT

Aircraft Jacking

Equipment Used:

1. **Tripod Jack:** A three-legged hydraulic jack used for lifting aircraft. It provides stability and support during the jacking process. Typically used under the wings or fuselage.
2. **Axle Jack:** A portable jack placed under the landing gear to lift specific parts of the aircraft. It's often used for changing tires or servicing brakes.
3. **Scissor Jack:** A mechanical jack that uses a scissor mechanism to lift the aircraft. It's less common but useful for smaller aircraft or lighter loads.
4. **Hydraulic Hand Pump:** Used to operate the hydraulic jacks, providing the necessary force to lift the aircraft.
5. **Load Cell:** A device used to measure the weight being applied to each jack, ensuring balanced lifting.
6. **Safety Stands:** Placed under the aircraft once it's lifted to provide additional support and prevent accidental lowering.
7. **Leveling Equipment:** Tools like spirit levels or electronic levelers to ensure the aircraft is level during maintenance.

Procedure for Jacking an Aircraft:

1. **Position the Jack:** Place the tripod or axle jacks at designated jacking points.
2. **Attach Hydraulic Hand Pump:** Connect the hydraulic hand pump to the jack.
3. **Lift the Aircraft:** Gradually pump the hydraulic hand pump to raise the aircraft to the desired height.
4. **Place Safety Stands:** Once the aircraft is lifted, place safety stands under it for additional support.
5. **Level the Aircraft:** Use leveling equipment to ensure the aircraft is level.

Aircraft Towing

Equipment Used:

1. **Towbar:** A rigid or telescoping bar used to connect the aircraft's nose gear to the towing vehicle. It allows for controlled movement and steering.
2. **Tow Tractor:** A powerful vehicle used to tow the aircraft. It has a strong engine and a low center of gravity to handle the aircraft's weight.

3. **Towbarless Tractor:** A specialized towing vehicle that connects directly to the aircraft's nose wheel, eliminating the need for a towbar.
4. **Headset Communication:** Used by ground personnel to communicate with the cockpit and towing team, ensuring safe and coordinated movement.
5. **Wheel Chocks:** Placed around the aircraft's wheels to prevent movement when the aircraft is parked.
6. **Safety Cones:** Placed around the towing area to mark safe zones and prevent accidents.
7. **Reflective Vests:** Worn by ground personnel for visibility and safety.

Procedure for Towing an Aircraft:

1. **Attach Towbar:** Connect the towbar to the aircraft's nose gear and the tow tractor.
2. **Communicate:** Ensure clear communication between ground personnel and the cockpit.
3. **Release Brakes:** Release the aircraft's brakes before starting the towing operation.
4. **Tow the Aircraft:** Gradually move the tow tractor, towing the aircraft to the desired location.
5. **Place Wheel Chocks:** Once the aircraft is in position, place wheel chocks around the wheels to prevent movement.
6. **Disconnect Towbar:** Disconnect the towbar and secure the aircraft.

any web link for images/drawings

Here are some links where you can find images and drawings related to aircraft jacking and towing equipment:

Aircraft Jacking Equipment:

<https://www.aircraftspruce.ca/catalog/lgpages/aircraftjacking.php>

<https://www.youtube.com/watch?v=2ij6Vbbs75M>

<https://www.youtube.com/watch?v=GKsLraZmO44>

<https://www.shutterstock.com/search/aircraft-jacking>

Aircraft Towing Equipment:

<https://www.aviationpros.com/gse/pushbacks-tractors-utility-vehicles/product/10026898/textron-gse-douglas-equipment-ltd-douglas-aircraft-towing-tractors>

https://www.123rf.com/stock-photo/aircraft_towing.html

<https://www.shutterstock.com/search/aircraft-towing>